The JAGUAR score predicts 1-month disability/death in ischemic stroke patient ineligible for recanalization therapy.

著者	Aryandhito Widhi Nugroho
year	2018-09-12
その他の言語のタイトル	JAGUARスコアは再開通療法適応外の虚血性脳卒中患者の1か月後の予後を予測できる
学位授与機関	滋賀医科大学
学位授与年度	平成30年度
学位授与番号	14202甲第812号
URL	http://hdl.handle.net/10422/00012515

doi: https://doi.org/10.1016/j.jstrokecerebrovasdis.2018.05.024

氏　　名	Aryandhito Widhi Nugroho
学位の種類	博士（医学）
学位記番号	博士甲博士第８１２号
学位授与の要件	学位規則第４条第１項
学位授与年月日	平成３０年　９月１２日
学位論文題目	The JAGUAR score predicts 1-month disability/death in ischemic stroke patient ineligible for recanalization therapy （JAGUAR スコアは再開通療法適応外の虚血性脳卒中患者の 1 か月後の予後を予測できる）
審査委員	主査　教授　村田　喜代史
	副査　教授　勝山　裕
	副査　教授　谷　眞至

別紙様式３（課程博士・論文博士共用）

論　文　内　容　要　旨

※整理番号	819	（ふりがな） 氏　　名	アリヤンディト ウィディ ヌグロホ Aryandhito Widhi Nugroho
学位論文題目	The JAGUAR score predicts 1-month disability/death in ischemic stroke patient ineligible for recanalization therapy（JAGUAR スコアは再開通療法適応外の虚血性脳卒中患者の１か月後の予後を予測できる）		

Background and Purpose. Stroke has increased its burden significantly over the past two and half decades, especially in the developing countries. In light of this matter, Asia deserves a special focus. Since more than half of the world's population dwell in this continent, the largest contribution to global stroke burden will most certainly come from its dominant developing countries. Despite rapid improvements in stroke management, specifically pertaining acute ischemic stroke (AIS) care with the advent of recanalization therapy, data on its availability and utilization in Asian developing countries yields questionable equity and adequacy. High medication and device cost, want of proper human resource and infrastructure are just among a number of issues in up-to-date AIS care implementation. Thus, the majority of AIS patients in Asian developing countries will surely consist of those ineligible for recanalization therapy.

Quick outcome prediction on admission of this particular group of patients may alleviate the stroke burden, not only by assisting clinicians to focus on high-risk conditions affecting prognosis, but also by offering sufficient information to patients and families for giving consent, and by providing policymakers with accountable data to help maintain equity among different level of services. We aimed to develop a simple prediction score of 1-month severe disability/death after onset in AIS patient ineligible for recanalization therapy based on readily and widely obtainable on-admission clinical, laboratory and radiological examinations in Asian developing countries.

Methods. Using the Shiga Stroke Registry, an ongoing population-based registry developed to provide comprehensive information for the management of acute ischemic and non-traumatic hemorrhagic stroke in Shiga Prefecture, Japan, analysis was performed on 1,617 acute AIS.....

（備考）１．論文内容要旨は、研究の目的・方法・結果・考察・結論の順に記載し、２千字程度でタイプ等を用いて印字すること。
２．※印の欄には記入しないこと。

別紙様式３の２（課程博士・論文博士共用）

（続紙）

Methods (continued). ....patients registered in the year 2011, aged ≥18 years old, that were ineligible for recanalization therapy. The following admission data were collected: age, sex, Japan Coma Scale score, history of prior stroke, atrial fibrillation, random blood glucose level, systolic blood pressure, pre-arrival dependency, and onset-arrival time. Multivariable logistic regression analysis was conducted to build the integer ß-coefficient-based scoring model, by rounding the multiplication result of each ß by a specific constant (maximum score (10) divided by maximum possible sum of ß) to the nearest integer. Developed models were discriminated and calibrated by calculating area under the receiver operating characteristics curve (AUC) with its 95% confidence interval (CI) and Hosmer-Lemeshow goodness-of-fit test, respectively. For interval validation, bias-corrected and accelerated mean and 95% CI of AUC, and goodness-of-fit test, were estimated within the bootstrapped study population repeated for 1000 times.

Results. Japan Coma Scale score (J), age (A), random glucose (G), untimely onset-to-arrival time (U), atrial fibrillation (A), and pre-arrival dependency status according to the modified Rankin Scale score (R), were recognized as independent predictors of outcome. Each of their β-coefficients was multiplied by 1.3, creating the JAGUAR score. Its area under the curve (95% confidence interval) were 0.901 (0.880-0.922) and 0.901 (0.900-0.901) in the original and bootstrapped population, respectively. Good calibration were identified in both study population (p= 0.27).

Conclusions. To the authors' knowledge, the JAGUAR score is the first Japanese prediction score of 1-month severe disability/death after onset in AIS patients ineligible for recanalization therapy, developed from a large ongoing multi-center population-based stroke registry and solely take into account immediately available clinical, laboratory, and radiological findings at admission. However, several limitations were identified: the use of Japan Coma Scale score instead of the National Institute of Health Stroke Scale score, the sole use of non-contrast brain computed tomography, and the only-Japanese study population inclusion. Nonetheless, the JAGUAR score can be an important prediction tool of severe disability/death in AIS patients ineligible for recanalization therapy that is able to be applied on admission with no complicated calculation and multimodal neuroimaging necessary, which concept thus suitable for implementation in Asian developing countries.

別紙様式８（課程博士・論文博士共用）

学位論文審査の結果の要旨

整理番号	８１９	氏　　名	ARYANDHITO WIDHI NUGROHO
論文審査委員			

（学位論文審査の結果の要旨）※明朝体１１ポイント、６００字以内で作成のこと

近年増加する急性脳虚血発作に対して、日本や欧米では血栓溶解療法や血管内再開通療法などの新しい治療が行なわれているが、アジア諸国では、人的あるいは経済的理由で実施が困難な場合が多い。したがって、アジア諸国では、血管再開通療法が実施できない患者において、来院時に予後予測が出来れば、限られた医療資源を有効に分配するための有用な情報となる。そこで、本論文では、滋賀脳卒中ネットに登録された症例データから再開通療法が実施されなかった症例を抽出し、その来院時に得られた簡便な指標の、発症１ヶ月後の予後との検証を行い、さらに、それらを組み合わせた予後予測スコアを考案し、以下の点を明らかにした。

1) Japan Coma Scale, 年齢、血糖値、発症-到着時間、心房細動、到着前患者状態（Rankin Score）のそれぞれが独立した予後予測因子であった。
2) これらの因子と予後との重回帰分析を行い、得られたそれぞれの因子の標準化偏回帰係数βに定数を乗じて四捨五入し、得られた整数値の総和が１０になるように定め、JAGUAR Score を考案した。
3) JAGUAR Score と１ヶ月後の予後予測能の ROC 解析を行い、AUC 値が 0.901 と高い予測能を持つことが明らかになった。

本論文は、急性脳虚血発作の予後予測指標について新たな知見を与えたものであり、また、最終試験として論文内容に関連した試問を実施したところ合格と判断されたので、博士（医学）の学位論文に値するものと認められた。

（総字数６３０字）

（平成　３０年　８月　２８日）